MATLAB for Data Analytics and Machine Learning

Course Duration: 05 days

Course Outcomes:

- Apply exploratory data analysis and data cleaning techniques in MATLAB.
- Utilize data visualization methods for effective presentation.
- Implement data processing techniques for efficient analysis.
- Build and evaluate regression and classification models using MATLAB.
- Apply predictive modeling and machine learning techniques in MATLAB

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Module 1: Introduction and Exploratory Data Analysis with MATLAB

- Introduction to Exploratory Data Analysis
- Understanding Data Types and Formats
- Importing and Exporting Data in MATLAB
- Data Cleaning and Transformation Techniques
- Lab: Hands-on exercises on data import, cleaning, transformation

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Module 2: Data Visualization and Introduction to Feature Engineering

- Basic and Advanced Data Visualization Techniques
- Lab: Hands-on exercises on data visualization
- Understanding Data Structure and Basic Statistical Analysis
- Data Sorting, Filtering, and Grouping Techniques
- Lab: Hands-on exercises on data sorting, filtering, and grouping

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Module 3: Data Processing and Feature Engineering with MATLAB

- Dealing with Missing Data and Outliers
- Data Normalization and Standardization
- Correlation Analysis and Feature Selection Techniques
- Domain-Specific Feature Engineering (Textual, Image, Audio Data)
- Lab: Hands-on exercises on data processing and feature engineering

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Module 4: Regression Machine Learning Models with MATLAB

- Introduction to Regression Analysis
- Building and Interpreting Regression Models in MATLAB

- Understanding the Supervised Machine Learning Workflow for Regression
- Preparing Data for Regression Models
- Training and Testing Regression Models
- Regression Model Evaluation and Improvement Techniques
- Lab: Hands-on exercises on building, testing, and evaluating regression models

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Module 5: Classification Machine Learning Models with MATLAB

- Introduction to Classification Analysis
- Building and Interpreting Classification Models in MATLAB
- Understanding the Supervised Machine Learning Workflow for Classification
- Preparing Data for Classification Models
- Training and Testing Classification Models
- Classification Model Evaluation and Improvement Techniques
- Introduction to Unsupervised Learning
- Lab: Hands-on exercises on building, testing, and evaluating classification models

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